



Patent Application of

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For

## **PERSONAL FLOTATION DEVICE**

### **BACKGROUND**

This invention relates to personal flotation devices (PFD), specifically the inflated type of devices that are user operated. It is impractical for participants of many active water sports to wear any type of life jackets even when they are in open water. In many of the physically demanding water sports as surfing, diving, swimming and sailing PFD are not used, usually, because they hamper body movements and interfere with their equipment. Surfing is a popular water sports that thousands of participants have been drowned. Flotation devices often are not practical for use by swimmers and divers. Scuba divers are often lost to drowning because there was no last line of protection. Many PFD provided by manufacturers are worn around the waist either in boxes or in the belt. After inflation most all of these PFD require the wearer to get into openings or buckle straps. When the victim is reached for rescue most PFD interferes with the efforts and must be removed for resuscitation.

The U.S. Pat. NO. 5,823,840 to Powers (1998) is an example of a PFD that the user wears on the wrist and is inflated in place, however, deployment requires that both hands to be momentary occupied. This is time that the wearer is not likely to have and if successfully deployed will be only hold the attached hand at the surface. An example of a PFD that the user wears on the arm is U.S. Pat. NO. 6,056,612 to Markwitz (2000) still more are ones that the user wears in a box on a waistline belt are the U.S. Pat. NO. 5,738,557 to Biesecker (1998), U.S. Pat. NO. 5,820,431 to Biesecker (1998) and also to Biesecker is U.S. Pat. NO. 6,004,177 (1999). A combination waist belt and shoulder PFD is the U.S. Pat. NO. 6,036,562 to Brown (2000) and continued to U.S. Pat.

NO. 6,394,866 to Brown (2002). Another PFD shown in U.S. Pat. NO. 5,779,512 to Rupert (1998) provides for concentrically joined rings to be inflated and worn at times for therapeutic swims. A transparent PFD for sun tanning purposes is seen in U.S. Pat. NO. 6,007,395 to Knoll (1999).

## **SUMMARY**

The invention, is an improved PFD is flexible tube shell with caps urged over and preferably sealed onto each end, each cap end having a clasp and preferably worn as a necklace by joining the clasps on each end. The flexible tube shell has an internal longitudinal groove and a distensible sack is longitudinally disposed internally throughout the length of the tube. An inflation means is connected to fill the sack. The gas source may be either a chemical gas generator or a conventional compressed gas cartridge.

A PFD is achieved when either the wearer or a rescuer pulls or yanks any place around the clasped "necklace" with enough force to pull the end cap off the tube. This punctures the seal of the cartridge releases gas from to fill each cell that expand outward causing adequate pressure to cause the flexible tube shell to be split along the internal groove and jettisoned.

To improve visibility the sack ideally will be a visible reflective color. Another aspect of the invention is that the tube of PFD could be decorated that would encourage it's use.

Accordingly several objects and advantages of the invention provide a PFD with broader use applications.

## **DRAWINGS**

**FIG. 1** is an orthographic view of the PFD.

**FIG. 2** is an orthographic view of the PFD in clasped position.

**FIG. 3** is a prospective view of the PFD inflated showing tube jettisoned.

**FIG. 4** is a section view taken 4-4.

**FIG.5** is a section view taken 5-5.

## **DESCRIPTION**

**FIG. 1** is a view of a PFD 1 in accordance with the invention having a flexible tube shell 2 with tab end cap 3 and opposite end receptacle end cap 6 each sealed to the end of flexible tube shell 2. A long sack 10 comprised of cells 4 having two opposing ends each containing gas source 5 is disposed in flexible tube shell 2.

**FIG. 2** is a view of the PFD 1 by means bent to permit the tab end cap 2 being coupled to receptacle end cap 6 providing a clasp in encircling ring 8 circumscribing a neck area 30.

**FIG. 3** is an orthographic view of the PFD 1 shown having been caused to inflate when encircling ring 8 is by means stretched causing the tube shell 2 end portions 9 each to be respectively withdrawn from the tab end cap 3 and the receptacle end cap 6. The internal stresses created by the inflating cells 4 causes tube shell 2 to split provided along groove 7 and is jettisoned. The invention a PFD (personal flotation device) is demonstrated when filled cells 4 having a coupled clasp 16 is circumscribing a neck area 30 provide buoyancy.

**FIG. 4** is a section view showing the typical end cap layout and compressed gas trigger device 18. External surface of end portion 9 is closely fitted to the internal surface 23 of end cap 3 and open end portion external surface 21 of cell 4 is joined and sealed to internal surface 21. The service loop 20 provides slack so the tube shell 2 end portions 9 can be forcibly withdrawn respectively from tab end cap 3 and receptacle cap 6. Housing 28 is retained to the gas cartridge

**22** and detent dog **32** is biased by inside wall of tube shell **2** to retain pierce plunger and hold spring **30** in compression.

**FIG. 5** is a section view showing the trigger device **18** and also a section of tube wall **2** having a longitudinal groove **7**.

**FIG. 6** When detent dog **32** is released allowing pierce plunger to be driven by spring **30** into membrane **24** thereby releasing compressed gas to fill cell **4**. This is repeated at the opposite end thereby providing a redundant feature and a PFD **1** according to the invention.